

# Georgia Institute of Technology

## School of Electrical and Computer Engineering

ECE 3043

Electrical and Electronic Circuits Laboratory

Verification Sheet

NAME: \_\_\_\_\_

SECTION: \_\_\_\_\_

AD LOGIN: \_\_\_\_\_

### Experiment 6: Basic Op-Amp Circuits 2

Procedure	Time Completed	Date Completed	Verification (Must demonstrate circuit)	Points Possible	Points Received
2. Differential Amplifier				25	
3. Instrumentation Amplifier				25	
4. Inverting Amplifier				25	
<b>4. Non-Inverting Amplifier</b>				25	

To be permitted to complete the experiment during the open lab hours, you must complete at least **four** procedures during your scheduled lab period or spend your entire scheduled lab session attempting to do so. A signature below by your lab instructor, Dr. Brewer, or Dr. Robinson permits you to attend the open lab hours to complete the experiment and receive full credit on the report. Without this signature, you may use the open lab to perform the experiment at a 50% penalty.

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

## ECE 3043 Check-off Requirements for Experiment 6

Make sure you have made all required measurements before requesting a check-off. For all check-offs, you must demonstrate the circuit or measurement to a lab instructor. All screen captures must have a time/date stamp.

### 2. Differential Amplifier

- ✓ Table of measured component values.
- ✓ Scope screen capture showing differential input voltages
- ✓ Calculations of  $A_d$ ,  $A_{cm}$ , and CMRR.
- ✓ Comparison to theoretical values

### 3. Instrumentation Amplifier

- ✓ Same as for Diff Amp

### 4. Inverting Amplifier

- ✓ Design the circuit of Figure 6.8 in the manual to have a midband gain of (last digit of GTID +1), an upper cutoff frequency of 15kHz and a lower cutoff frequency of 150Hz. Choose a value of  $C_F$  and calculate the remaining values. If possible, R values should be in the range  $100\Omega$  to  $100k\Omega$  and C values should be between 100pF and 47uF.
- ✓ Plot of gain versus frequency using HPVVEE or LabView. Use a frequency range of 10 Hz to 100 kHz and an input voltage of 0.1 V<sub>rms</sub>.
- ✓ Recorded midband gain, upper cutoff frequency, and lower cutoff frequency. Use cursors to measure.
- ✓ Comparison of measured characteristics to the design specifications.

### 4. Non-Inverting Amplifier

- ✓ Design the circuit of Figure 6.9 in the manual to have a DC gain of 0.5, a DC input impedance of  $10k\Omega$ , a high frequency gain of 8, and a pole frequency of (last digit of GTID +1)kHz. Choose the capacitor value to give R's in the range  $100\Omega$  to  $100k\Omega$ .
- ✓ Same as for 6, but measure the low frequency gain, the high frequency gain, and the pole frequency.